Science Toolkit: Grade 8 Objective 1.A.1.a

Student Handout: Science: Grade 8 Objective 1.A.1.a

Standard 1.0 Skills and Processes

Topic A. Constructing Knowledge

Indicator 1. Design, analyze, or carry out simple investigations and formulate appropriate conclusions based on data obtained or provided.

Objective a. Explain that scientists differ greatly in what phenomena they study and how they go about their work.

Selected Response (SR) Item

Question

Use the technical passage 'Drilling to the Mantle' to answer the following.

The scientists working at the Integrated Ocean Drilling Program are most likely

A. researching the structure of the planet
B. looking for more information about ocean food webs
C. investigating how fish live in the depths of the ocean
D. trying to understand how the ocean influences weather

Correct Answer

A. researching the structure of the planet

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Handouts

Drilling to the Mantle

In early 2005, scientists working in the Integrated Ocean Drilling Program (IODP) drilled the third deepest hole ever made in the ocean floor. They were attempting to reach the mantle of Earth. They drilled under water instead of on land because ocean plates are much thinner than continental plates—5 kilometers thick as opposed to 30 kilometers thick.

The IODP drilling occurred at the Atlantis Massif, a large dome-shaped area in the North Atlantic Ocean that is about 16 kilometers wide. In this area, the crust is very thin and the ocean is shallow, making the project easier.

Seismic data were used to choose the location of the thinnest crust. This area is characterized by metamorphic rock deposits. Unfortunately, scientists think the drilling occurred about 305 meters from the correct location. Although rock was recovered from up to 1,416 meters below the sea floor, the mantle was not reached.

There were still useful results, however. One scientist said that the rock collected was from some of the deepest sections of the crust ever reached. These rocks will give geologists a chance to learn more about how the crust was formed.

Rocks brought to the surface from deep in the crust of Earth help geologists better understand the structure of the planet and how it formed. Early ideas about the evolution of Earth are being revised because of these new rock samples.

Scientists know that mantle material is very different from crust material. For example, mantle rock has a different texture and composition than crust material. The amount of minerals in the crust also is different from the amount of minerals in the mantle.

“Drilling to the Mantle.” Courtesy: National Science Foundation